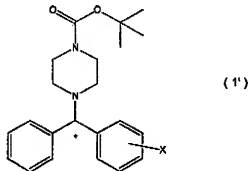


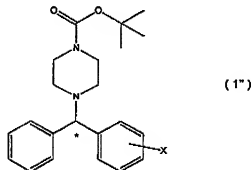
WHAT IS CLAIMED IS:

1. An optically active 4-(tert-butoxycarbonyl)piperazine compound of formula (1):



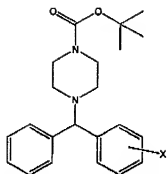
wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designate an asymmetric carbon atom.

2. A composition comprising  
an optical isomer of formula (1''):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designate an asymmetric carbon atom, and  
an enantiomer thereof, in an optional ratio.

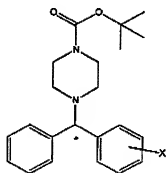
3. A 4-(tert-butoxycarbonyl)piperazine compound of formula (1):



(1)

wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group.

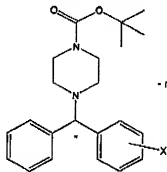
4. An optical isomer of formula (1''):



(1'')

wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designate an asymmetric carbon atom, or salts thereof.

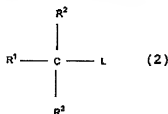
5. An adduct salt of formula (3):



- nZ (3)

wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designate an asymmetric carbon atom, n represents

an integer of 1 or 2, and Z represents  
an optically active acid of formula (2):



wherein L represents  $-\text{COOH}$  or  $-\text{SO}_3\text{H}$ ,

R<sup>2</sup> represents a hydrogen atom or a hydroxyl group,

R<sup>1</sup> and R<sup>3</sup> are the same or different and each independently  
represent

a hydrogen atom, a halogen atom, an arylcarbonyloxy group,

a liner or branched alkyl group which may be substituted with at

least one group selected from a hydroxyl group, a halogen atom, an  
arylcarbonyloxy group, a carboxy group and an arylaminocarbonyl group;

an aryl group which may be substituted with at least one group  
selected from a halogen atom, an alkyl group and an alkoxy group;

an aralkyl group which may be substituted with at least one group  
selected from a halogen atom, an alkyl group, an alkoxy group and a  
hydroxyl group;

an aryloxy group which may be substituted with at least one  
group selected from a halogen atom, an alkyl group, an alkoxy group and  
a hydroxyl group;

a cyclic alkyl group which may be substituted with at least one  
group selected from a halogen atom, an alkyl group, an alkoxy group and  
a hydroxyl group; or

a cyclic alkyl group which may be substituted with at least one  
group selected from a halogen atom, an alkyl group, an alkoxy group, a  
hydroxyl group and a phenylcarbonylamino group; or

R<sup>1</sup> and R<sup>3</sup> may be bonded together to form

an alkylene group which may be substituted with at least one group selected from a halogen atom, an alkyl group, an alkoxy group, a carboxyl group, an oxo group, a hydroxyl group, and a phenylcarbonylamino group, or

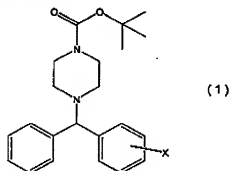
a heterocycle which may be substituted with at least one group selected from an alkyl group, alkoxy or a halogen atom.

6. An adduct salt according to claim 5, wherein the acid of formula (2) is optically active O,O'-dibenzoyltartaric acid.

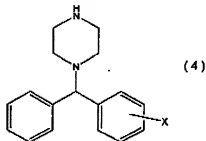
7. An adduct salt according to any one of claims 1, 2, 3, 4, 5, or

6, wherein X represents a chlorine atom at 4-position of the phenyl group.

8. A process for producing a 4-(tert-butoxycarbonyl)piperazine compound of formula (1):



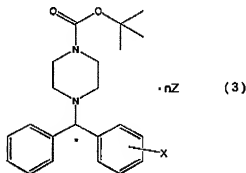
wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, which comprises reacting 1-[(substituted phenyl)phenylmethyl]piperazine of formula (4):



wherein X has the same meaning as defined above, with di-tert-butyl dicarbonate of formula (5):

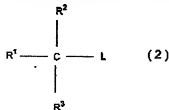


9. A process for producing an optically active adduct salt of formula (3):



5 wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, \* represents an asymmetric carbon atom, and n represents an integer of 1 or 2, and

Z represents an optically active acid of formula (2):



10 wherein L represents  $-COOH$  or  $-SO_3H$ ,

$R^2$  represents a hydrogen atom or a hydroxyl group;

$R^1$  and  $R^3$  are the same or different and independently represent a hydrogen atom, a halogen atom, or an arylcarbonyloxy group;

a liner or branched alkyl group which may be substituted with at

15 least one group selected from a hydroxyl group, a halogen atom, an arylcarbonyloxy group, a carboxy group and an arylaminocarbonyl group;

an aryl group which may be substituted with at least one group selected from a halogen atom, an alkyl group and an alkoxy group;

an aralkyl group which may be substituted with at least one group

20 selected from a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

an aryloxy group which may be substituted with at least one group selected from a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

a cyclic alkyloxy group which may be substituted with at least one group selected from a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group; or

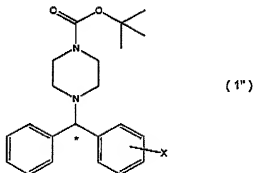
a cyclic alkyl group which may be substituted with at least one group selected from a halogen atom, an alkyl group, an alkoxy group, a hydroxyl group and a phenylcarbonylamino group; or

R<sup>1</sup> and R<sup>3</sup> may be bonded together to form

an alkylene group which may be substituted with at least one group selected from a halogen atom, an alkyl group, an alkoxy group, a carboxyl group, an oxo group, a hydroxyl group, and a phenylcarbonylamino group, or

a heterocycle which may be substituted with at least one group selected from an alkyl group, an alkoxy group and a halogen atom,

which comprises reacting a composition comprising an optical isomer of 4-(tert-butoxycarbonyl)piperazine compound of formula (1''):



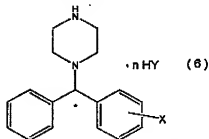
wherein X and \* designate the same as defined above, and an enantiomer thereof, with an optically active acid of formula (2) as defined above.

10. A process according to claim 9, which further comprises recrystallizing the acid adduct salt of the optically active

4-(tert-butoxycarbonyl)piperazine of formula (3).

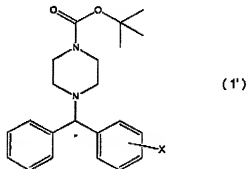
11. A process according to claim 9 or 10, which further comprises reacting an adduct salt of formula (3), with a base to produce an optically active 4-(tert-butoxycarbonyl)piperazine of formula (1').

12. A process for producing an adduct salt of formula (6):



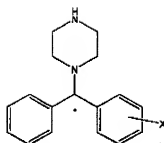
wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, \* represents an asymmetric carbon atom, and n represents an integer of 1 or 2,

Y represents a halogen atom,  $-\text{OSO}_3\text{H}$ ,  $-\text{OSO}_2\text{CH}_3$ ,  $-\text{OCOCF}_3$ ,  $-\text{OCOCH}_3$  and  $-\text{COOH}$ , which comprises reacting an optically active 4-(tert-butoxycarbonyl)piperazine of formula (1'):



wherein X and \* designate the same as defined above, with an acid of formula: HY, wherein Y represents the same as defined above.

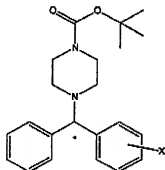
13. A process for producing an optically active 1-[(substituted phenyl)phenylmethyl]piperazine of formula (7):



(7)

wherein X and \* each have the same meaning as defined above, which process comprises reacting an optically active

4-(tert-butoxycarbonyl)piperazine compound of formula (1'):



(1')

wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, \* represents an asymmetric carbon atom, with an acid and subsequently with a base.